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A facial expression of pax: Assessing children's "recognition" of emotion from faces



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ABSTRACT

In a classic study, children were shown an array of facial expressions and asked to choose the person who expressed a specific emotion. Children were later asked to name the emotion in the face with any label they wanted. Subsequent research often relied on the same two tasks—choice from array and free labeling—to support the conclusion that children recognize basic emotions from facial expressions. Here five studies ($N = 120$, 2- to 10-year-olds) showed that these two tasks produce *illusory recognition*; a novel nonsense facial expression was included in the array. Children “recognized” a nonsense emotion (*pax* or *tolen*) and two familiar emotions (fear and jealousy) from the same nonsense face. Children likely used a process of elimination; they paired the unknown facial expression with a label given in the choice-from-array task and, after just two trials, freely labeled the new facial expression with the new label. These data indicate that past studies using this method may have overestimated children’s expression knowledge.

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Introduction

When presented with an array of facial expressions (such as those claimed to signal happiness, sadness, and fear) and asked to find the person who is afraid, children as young as 2 years select the predicted expression more often than would be expected by chance. The assumption has been that the

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task reveals children's prior knowledge of what emotion is signaled by, in this case, the fear expression. Here we present evidence that at least some of this knowledge can instead be created by the experiment.

Evidence from the choice-from-array task has been claimed to show that young children recognize happiness, sadness, anger, fear, surprise, disgust, and even pride (Denham, McKinley, Couchoud, & Holt, 1990; Gagnon, Gosselin, Hudon-ven der Buhs, Larocque, & Milliard, 2010; Gagnon, Gosselin, & Maassarani, 2014; Harrigan, 1984; Izard, 1971; Kayyal & Russell, 2013; McClure, 2000; Nelson & Russell, *in press*; Székely et al., 2011; Tracy, Robins, & Lagattuta, 2005). Izard (1971) showed that, following the choice-from-array task, children also freely label the facial expression with the predicted emotion label. Indeed, children as young as 2 years produce the expected label for at least some of the same expressions (Gates, 1923; Izard, 1971; Markham & Adams, 1992; Nelson & Russell, 2011b; Widen, 2013; Widen & Russell, 2003, 2008), again complementing the conclusion that young children recognize emotions from facial expressions. Many subsequent studies of children used the same tasks: choice from array and free labeling.

The idea of recognition of certain facial expressions during early childhood is embedded within the prevailing conceptual framework in the science of emotion, namely, basic emotion theory. Evidence with young children complements evidence from remote cultures (Ekman, 1980) and from people born with congenital blindness (Tracy & Matsumoto, 2008). Although basic emotion theory does not predict the precise age at which children can recognize basic emotions from their facial expressions, some researchers have offered evidence that such recognition occurs during the first year of life (Hoehl & Striano, 2010; Izard, 2011; Izard, Woodburn, & Finlon, 2010; Martens, Hamlin, & Tracy, 2013). Such evidence resonates with basic emotion theory because early recognition fits with its evolutionary account in which caregivers can signal to a preverbal child that, for example, a certain animal is dangerous or a certain food is disgusting; the child who then avoids the current harm is more likely to survive (Izard, 1994).

In this article, we argue that the choice-from-array task can yield *illusory recognition*; children can “recognize” various, even nonexistent, emotions from the same made-up nonsense expression—an expression that no one has proposed as a signal of any emotion. When children know some face–label pairings, they can then use a process of elimination to match the unknown face to a label not yet paired with a face. A fast-mapping process may then allow children to learn, with just one or two exposures, the new label associated with the new expression. When the choice-from-array task is followed by a free labeling task (e.g., as in Izard, 1971), children then use their newfound knowledge of the face and label pairing to label the expression with the expected label. If children used this strategy in emotion recognition tasks in prior research, they would have appeared to recognize the correct emotion from an expression—in both the choice-from-array and subsequent free labeling tasks—even if they were unfamiliar with either the emotion label or expression presented.

Preschoolers and toddlers have been shown to use the process of elimination as a word learning strategy; children match unfamiliar labels to objects or properties that they do not yet have labels for, including color (Carey & Bartlett, 1978), objects (Au & Markman, 1987), animals (Au & Glusman, 1990), verbally provided facts (Waxman & Booth, 2000), adjectives (Diesendruck, Hall, & Graham, 2006), and actions (Waxman, Lidz, Braun, & Lavin, 2009). It is not known, however, whether the process of elimination and fast mapping occur with facial expressions. Of course, if children already know which basic emotion goes with a facial expression, an elimination strategy would not be necessary. Whether children use a process of elimination when confronted with an array of facial expressions has not, to our knowledge, been explored.

Overview

To determine whether children can use a process of elimination in choice-from-array tasks to match novel labels to novel expressions, as well as known labels to novel expressions, we conducted five studies in which children (2- to 4-year-olds and 5- to 10-year-olds) were presented with arrays of facial expressions. In each array, the facial expressions, such as those for happiness and sadness, were likely familiar to children (Bullock & Russell, 1984; Camras & Allison, 1985; Denham & Couchoud, 1990; Nelson, Hudspeth, & Russell, 2013; Nelson & Russell, 2011a; Widen & Russell, 2003)—with

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